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(11) Publication number: **0 474 777 B1**

(12)

## EUROPEAN PATENT SPECIFICATION

(45) Date of publication of patent specification:  
03.02.93 Bulletin 93/05

(51) Int. Cl.<sup>5</sup>: **A61F 13/46**

(21) Application number: **90909796.6**

(22) Date of filing: **31.05.90**

(86) International application number:  
**PCT/SE90/00376**

(87) International publication number:  
**WO 90/14814 13.12.90 Gazette 90/28**

(54) **DISPOSABLE ABSORBENT ARTICLES.**

*Diapers (s) P-30-FX*

(30) Priority: **31.05.89 SE 8901965**

(43) Date of publication of application:  
**18.03.92 Bulletin 92/12**

(45) Publication of the grant of the patent:  
**03.02.93 Bulletin 93/05**

(84) Designated Contracting States:  
**AT BE CH DE DK ES FR GB IT LI NL SE**

(56) References cited:  
**US-A- 4 655 759**

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EP 0 474 777 B1

lengths of said fold lines. However, the fold lines shall be positioned so that the liquid-receiving part of the article, the so-called wetting location, is framed by the edge-parts 7, 8 and therewith constitutes a region of the central part 6. It should be mentioned in this connection that the distance between the fold lines 3 may have any desired value and does not therefore limit the scope of the invention.

The seams or joins 4 in respective end-parts 9, 10 may be smaller or greater than three in number and may also be excluded totally. Similar to the fold lines 3, the seams 4 may have the form of discrete punctiform weldbonds or may comprise continuous, curved seams where the shape of the curve is optional. The seams 4 result in a smaller article contact-surface with the body of the wearer, therewith enhancing the comfort of the article when worn.

Figure 2 illustrates an example of upward-folding of the edge-parts 7, 8 in accordance with the invention. The expression "upward-folding" as used here includes all manner of folding or bending of the edge-parts which will cause the edge-parts located externally of the fold-lines, when viewed as a whole, to form upstanding embankments or like walls in relation to the central part, seen in a direction towards the wearer. For instance, as illustrated in Figure 2, the edge-part can be folded double in its longitudinal direction, where-with the outer longitudinally extending part will be folded in a direction away from the wearer. Appropriate fixation of the fold will result in a reduction in the transverse extension of the edge-parts, causing an increase in the vertical extension or height extension of said edge-parts, such that the edge-parts form upstanding embankment walls.

Located immediately beneath the liquid-permeable sheet 2 is fibre wadding body 11. This wadding forms part of an absorbent pad, generally shown at 12, and functions to receive the liquid excreted and to permit the liquid to pass rapidly therethrough. The wadding is preferably loosely packed and is resilient in both its dry and its wet state. The fibre wadding 11 may comprise, for instance, thermoplastic, weldable fibres, such as polyester, polypropylene or polyethylene fibres or mixtures thereof. So-called bicomponent fibres are suitable materials in this regard, by which is meant fibres which comprise two kinds of polymer, for instance polypropylene/polyethylene, polyester/polyester or polyester/polyethylene. The fibre wadding 11 may be either a woven or non-woven structure, without departing from the inventive concept. Heat and binding agents are examples of the means by which a fibre wadding structure can be bound. The adhesive bonding agent may, for instance, be latex. The wadding may also be hydrophobic or hydrophilic. It will be understood that natural fibres which exhibit the aforesaid properties can also be used.

That part of the absorbent pad 12 located be-

neath the wadding comprises two layers of superabsorbent material 13, 14 which is placed in powder form between a plurality of tissue layers 15. The superabsorbent material may have a form other than powder, e.g. may have the form of fibres. By superabsorbent material is meant a material which can absorb a liquid quantity corresponding to several times its own weight. The superabsorbents in respective layers differ essentially with regard to absorption properties, absorption rates and liquid-retention abilities when subjected to pressure. The superabsorbent in layer 14 has a very high absorption rate, whereas the superabsorbent in layer 13 has a very pronounced ability to retain liquid when subjected to pressure. Each of the tissue layer 15 may comprise one or more layers of tissue. It is also conceivable to use other types of carrier material than tissue, for instance non-woven material.

Placed beneath the absorbent pad 12 and between said pad and the liquid-permeable sheet 2 extending peripherally around the whole of the article is a liquid-impermeable sheet 16 made, for instance, of polyethylene or polypropylene. The liquid-permeable sheet 2 is joined to the liquid-impermeable sheet 16, e.g., with the aid of an adhesive binder, whereas the fibre wadding 11 is neither connected to the liquid-permeable sheet 2 nor to the liquid-impermeable sheet 16, with the exception of the seam or join locations 3, 4 and 5. The liquid-impermeable sheet 16 extends upwards to some extent along the upwardly raised edge-part 7, 8 which provides additional protection against leakage from the sides of the article. The layer 16 extends around the margins of the end-parts 9, 10 and slightly inwardly thereof, as indicated by a broken line 17 in Figure 1.

The edge-parts 7, 8 are joined in a double-fold, by means of a bonding means 20, for instance by means of an adhesive binding agent or a punctiform weld, a region 21, 22 of the liquid-permeable sheet 2 being joined with another region 23, 24 of said sheet within the same respective edge-parts 7, 8 on the side surface of the article 1 facing away from the user, i.e. the underside 25 of said article. The binding agent is, for instance, applied in the form of one or more glue points. The punctiform weld-joins may be one or more in number.

When the edge-parts 7, 8 are folded in this manner and fixated to the underside 25 of the article, the edge-parts 7, 8 of the article impart to said article, as seen in its cross-direction, a convex shape towards the central part 6, at the same time as said edge-parts 7, 8 are erected to a raised position in relation to the central part 6 as seen in the height extension of the article. When the article is in use, the wearer's thighs will press the edge-parts 7, 8 towards the central part 6, but because the edge-parts 7, 8 in their upwardly raised positions curve inwardly towards the central part 6, the occurring pressure forces will accentuate

still further the damming effect of the central part 6 and counteract the tendency of the edge-parts 7, 8 to gape. Thus, in accordance with the present invention, the apparently disadvantageous fact that the thighs of the wearer will deform the article in its transverse direction is utilized in a beneficial manner to provide a considerably improved absorbent product or article, both from the aspect of liquid collection and leakage. The edge-parts 7, 8 can be folded and fixated in a number of ways within the scope of the following claims.

By constructing the inventive article from materials other than those conventionally used, it is not only possible to obtain a three-dimensional article by folding up the edge-parts of the article along said fold lines, but also to obtain considerably improved liquid-retention and a drier abutment surface against the wearer's skin than in the case of traditionally constructed absorbent pads in which the absorption material is mainly cellulose fluff. The fibres of cellulose fluff normally have the drawback of discharging absorbed liquid when subjected to pressure, causing the surface material closest to the wearer's body to become moist or wet, and therewith resulting in increased discomfort for the wearer. As a result of placing fibre wadding immediately beneath the liquid-impermeable surface material, the article will obtain a dry surface while, at the same time, the wadding will provide a soft and comfortable layer of material against the wearer's skin. The structure of the fibre wadding includes very coarse capillaries in comparison with the cellulose fluff, and consequently liquid will be transported very rapidly in the fibre wadding.

Furthermore, the fibre wadding alienates the liquid absorbed in the absorbent pad from the body of the wearer, wherein the surface of the absorbent article will be felt to be dry and comfortable, even when the article has been in use for some time. The fibre wadding also contributes towards configuring the article.

By choosing suitable material, it is possible to produce in the voluminous bulky wadding layer a durable bond between surface material, fibre wadding and absorbent pad, or, as seen from the side of the article remote from the wearer, between surface material, plastic-barrier layer and absorbent pad, e.g. by gluing or welding. Because the fibre wadding comprises thermoplastic fibres and is also highly voluminous, the application of joins or seams therein will form in the bulky wadding deep, distinctive fold lines, outside of which the edge-parts of the article are folded-up so as to dam-in the central part of the article located between said edge-parts, said edge-parts being fixated in their upwardly raised positions in relation to said central part.

Attached to the underside 25 of the article is an adhesive layer or strip 18, by means of which the article can be removably fastened to the user's under-

clothes when wearing said article. Prior to use, this adhesive layer 18 is protected by a protective strip 19, which is preferably treated with a release agent on the side thereof facing the adhesive layer 18 and which can be readily removed when the article 1 is to be worn, so as to expose the adhesive layer 18 for active use.

Figure 3 illustrates another embodiment of an absorbent article, here referenced 1'. Similar to the article 1, the article 1' incorporates a liquid-permeable sheet 2, which is located nearest the wearer, two longitudinally extending fold lines 3, a central part 6, two end-parts 7, 8, and end-seals 5 which seal-off the end-parts 9', 10' of said article, the rear end-part 9' is much larger than the front end-part 10', so as to be able to receive faeces. Because of its enlarged end-part 9', the article 1' is able to enclose a larger absorbent pad than the article 1 of the embodiment before described, thereby enabling the article 1' to absorb much larger quantities of liquid than those for which the article 1 is intended, for instance adult incontinence.

A number of modifications are conceivable within the scope of the claims.

For instance, fold lines may also be provided on the underside of the article, with the intention of further amplifying the fold lines produced on the upper side thereof. Naturally, a layer of fibre wadding can also be positioned between the absorbent pad and the liquid-impermeable sheet in this case. Thus, all of the material incorporated in the article can be joined together along the fold lines in conjunction therewith.

The methods by which the fold lines, for instance, seaming, glueing, welding, can also be combined. For instance, the liquid-permeable sheet can be welded to the fibre wadding while glueing the wadding to the absorbent pad along the fold lines.

In addition to the absorbent pad described with reference to the illustrated exemplifying embodiments, a number of other absorbent pad constructions known to the person skilled in this art may be incorporated in the inventive article. For instance, the absorbent pad described with reference to Figure 2 may be supplemented with a number of layers of tissue or the like placed on one or both sides of the absorbent body. It is also possible to use an absorbent pad made of cellulose fluff, optionally with superabsorbents mixed therein. The absorbent pad may also have admixed therein material which has no absorbing function, but which serves to improve binding to the surrounding thermoplastic sheets. Such material may, for instance, comprise melt fibres. As will be understood, the fibre wadding may be totally excluded if so desired, in which case the article will solely include an absorbent body comprising cellulose fluff, with or without superabsorbents or other absorbent material.

## Claims

1. An absorbent article (1, 1') intended for one time use only, such as a diaper, an incontinence guard or the like, comprising a liquid-permeable casing sheet (2), which when the article is worn lies nearest the body of the wearer, a liquid-impermeable casing sheet (16), and an absorbent pad (12) enclosed between the two casing sheets, the article has provided in the longitudinal direction thereof at least two permanently formed fold lines (3) which divide the article, over at least a part thereof, into a central elongated part (6) and two edge-parts (7, 8) located symmetrically on a respective side of said elongated part, **characterized** in that a longitudinally extending part (21, 22) of the outer casing-sheet of each edge-part (7, 8), as seen in relation to a user, is joined to a further longitudinally extending part (23, 24) of said outer casing sheet, such as to curve intermediate parts of respective edge-parts (7, 8); and in that joining means (20) are provided for permanently fixating these parts in a mutually joined state, whereby the curved parts of said edge-parts externally of the central part (6) form inwardly upstanding embankment walls.
2. An article (1, 1') according to Claim 1, **characterized** in that the edge-parts (7, 8) are folded double; and in that the joining means (20) function to join the outer marginal-regions (21, 22) of said edge-parts with the outer surface of the article on the side thereof distal from the wearer when the article is worn.
3. An article (1, 1') according to Claim 1 or 2, **characterized** in that the joining means (20) function to join the outer marginal regions (21, 22) with the regions (23, 24) externally of the central part (6) as seen in the transverse direction of the article.
4. An article (1, 1') according to Claim 1 or 2, **characterized** in that the joining means (20) function to join the outer marginal regions (21, 22) with the central part (6).
5. An article (1, 1') according to any one of the preceding claims, **characterized** in that the absorbent pad (12) incorporates a layer of loosely packed fibre wadding (11) at a location nearest the liquid-permeable sheet (2), said fibre wadding having spring-back properties.
6. An article (1, 1') according to Claim 5, **characterized** in that the fibres of the fibre wadding (11) are polyester, polypropylene, polyethylene fibres or mixtures thereof.

7. An article (1, 1') according to any one of the preceding claims, **characterized** in that the fold lines (3) comprise seam welds.
8. An article (1, 1') according to any one of the preceding claims, **characterized** in that the folding lines (3) comprise adhesive bonds.

## Patentansprüche

1. Absorbierender Wegwerfartikel, wie z.B. eine Windel, ein Inkontinenzschutz, oder dergleichen, mit einem flüssigkeitsdurchlässigen Deckblatt (2), das beim Tragen des Artikels nahe am Körper der Trägerperson liegt, einem flüssigkeitsundurchlässigen Deckblatt (16) und einem absorbierenden Kissen (12), das zwischen den beiden Deckblättern eingeschlossen ist, wobei der Artikel in seiner Längsrichtung wenigstens zwei dauerhaft geformte Faltlinien (3) hat, die den Artikel wenigstens in eine Teil davon in einem mittigen, länglichen Teil (6) unterteilen sowie in zwei Kantenteile (7, 8), die an der jeweiligen Seite des länglichen Teiles (6) symmetrisch angeordnet sind, dadurch **gekennzeichnet**, daß ein sich in Längsrichtung erstreckender Teil (21, 22) des äußeren Deckblattes jedes Kantenteiles (7, 8), in bezug auf einen Benutzer gesehen, mit einem weiteren, sich längserstreckenden Teil (23, 24) des äußeren Deckblattes verbunden ist, um auf diese Weise Zwischenteile der jeweiligen Kantenteile (7, 8) aufzuwölben, und daß Verbindungsmittel (20) zum dauernden Fixieren dieser Teile in miteinander verbundenem Zustand vorgesehen sind, wobei die aufgewölbten Teile der Kantenteile außerhalb des mittleren Teiles (6) nach innen vorstehende Aufwölbungs-Wände bilden.
2. Artikel (1, 1') nach Anspruch 1, dadurch gekennzeichnet, daß die Kantenteile (7, 8) doppelt gefaltet sind und daß die Verbindungsmittel (20) dazu dienen, die äußeren Randbereiche (21, 22) mit der Außenfläche des Artikels an dessen Seite zu verbinden, die von der Trägerperson dann abgewandt ist, wenn der Artikel getragen wird.
3. Artikel (1, 1') nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Verbindungsmittel (20) die äußeren Randbereiche (21, 22) mit den Abschnitten (23, 24) außerhalb des mittleren Teiles (6) verbinden, in Querrichtung des Artikels gesehen.
4. Artikel (1, 1') nach Anspruch 1 oder 2, dadurch gekennzeichnet, daß die Verbindungsmittel (20) die äußeren Randbereiche (21, 22) mit dem mitt-

ieren Teil (6) verbinden.

5. Artikel (1, 1') nach einem der vorangegangenen Ansprüche, dadurch gekennzeichnet, daß das absorbierende Kissen (12) eine Schicht von lose gepackter Faser-Wattierung an derjenigen Stelle umfaßt, die dem flüssigkeitsdurchlässigen Deckblatt (2) am nächsten ist, wobei die Faser-Wattierung Rücksprung-Eigenschaften aufweist.
6. Artikel (1, 1') nach Anspruch 5, dadurch gekennzeichnet, daß die Fasern der Faserwattierung (11) aus Polyester, Polypropylen, Polyäthylen oder aus Mischungen dieser Stoffe bestehen.
7. Artikel (1, 1') nach einem der vorangegangenen Ansprüche, dadurch gekennzeichnet, daß die Faltlinien (3) Nahtverschweißungen umfassen.
8. Artikel (1, 1') nach einem der vorangegangenen Ansprüche, dadurch gekennzeichnet, daß die Faltlinien (3) Klebverbindungen umfassen.

#### Revendications

1. Article absorbant (1, 1') destiné à être utilisé une seule fois, comme par exemple une couche-culotte, une protection pour incontinents ou autre article analogue comprenant une feuille enveloppe (2) perméable aux liquides, qui lorsque l'article est utilisé, se trouve le plus près du corps de l'utilisateur, une feuille-enveloppe (16) imperméable aux liquides et un tampon absorbant (12) enfermé entre les deux feuilles-enveloppes, l'article comportant dans sa direction longitudinale au moins deux lignes de pli (3) qui sont formées de façon permanente et qui divisent l'article, sur au moins une partie de celui-ci, en une partie centrale allongée (6) et deux parties de bord (7, 8) disposées symétriquement sur un côté respectif de ladite partie allongée, caractérisé en ce qu'une partie (21, 22) qui s'étend longitudinalement et que comporte la feuille-enveloppe extérieure de chaque partie de bord (7, 8), telle que vue par rapport à l'utilisateur, est associée à une autre partie (23, 24) qui s'étend longitudinalement et que comporte la feuille-enveloppe extérieure, de manière à courber les parties intermédiaires des parties marginales respectivement (7, 8), et en ce que des moyens d'association (20) sont utilisés pour fixer de façon permanente ces parties dans un état mutuellement associé, grâce à quoi les parties courbées des parties de bord extérieures de la partie centrale (6) forment des parois d'endiguement s'étendant vers le haut et vers l'intérieur.

2. Article (1, 1') selon la revendication 1, caractérisé en ce que les parties de bord (7, 8) forment un double pli et en ce que les moyens d'association (20) ont pour fonction d'associer les régions marginales extérieures (21, 22) desdites parties de bord à la surface extérieure de l'article sur le côté de celui-ci qui est éloigné de l'utilisateur lorsque l'article est en service.

3. Article (1, 1') selon la revendication 1 ou 2, caractérisé en ce que les moyens d'association (20) ont pour fonction d'associer les régions marginales extérieures (21, 22) aux régions (23, 24) situées à l'extérieur de la partie centrale (6) telle que vue dans la direction transversale de l'article.

4. Article (1, 1') selon la revendication 1 ou 2, caractérisé en ce que les moyens d'association (20) a pour fonction d'associer les régions marginales extérieures (21, 22) à la partie centrale (6).

5. Article (1, 1') selon l'une quelconque des revendications précédentes, caractérisé en ce que le tampon absorbant (12) comprend à un endroit situé le plus près de la feuille (2) perméable aux liquides, une couche d'un rembourrage (11) en fibres faiblement tassées, ledit rembourrage en fibres ayant des propriétés de retour élastique dans l'état initial.

6. Article (1, 1') selon la revendication 5, caractérisé en ce que les fibres du rembourrage (11) sont des fibres en polyester, polypropylène, polyéthylène ou un mélange de ces fibres.

7. Article (1, 1') selon l'une quelconque des revendications précédentes, caractérisé en ce que les lignes de pli (3) comprennent des joints soudés.

8. Article (1, 1') selon l'une quelconque des revendications précédentes, caractérisé en ce que les lignes de pli (3) comprennent des liaisons par adhésif.

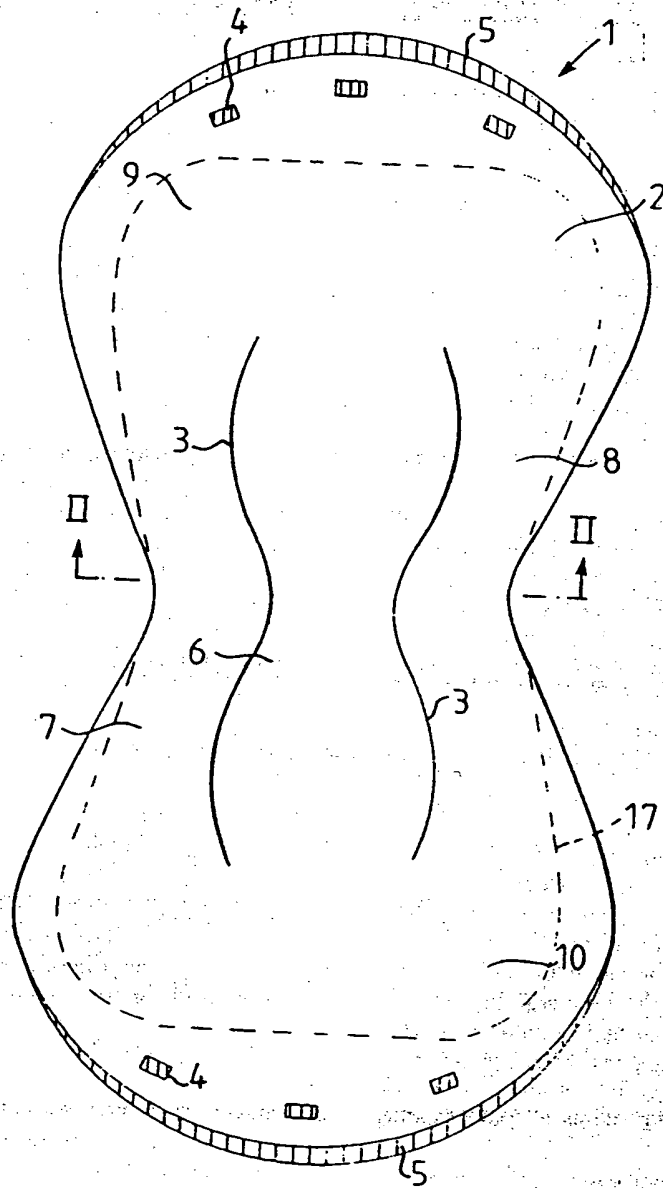


FIG.1

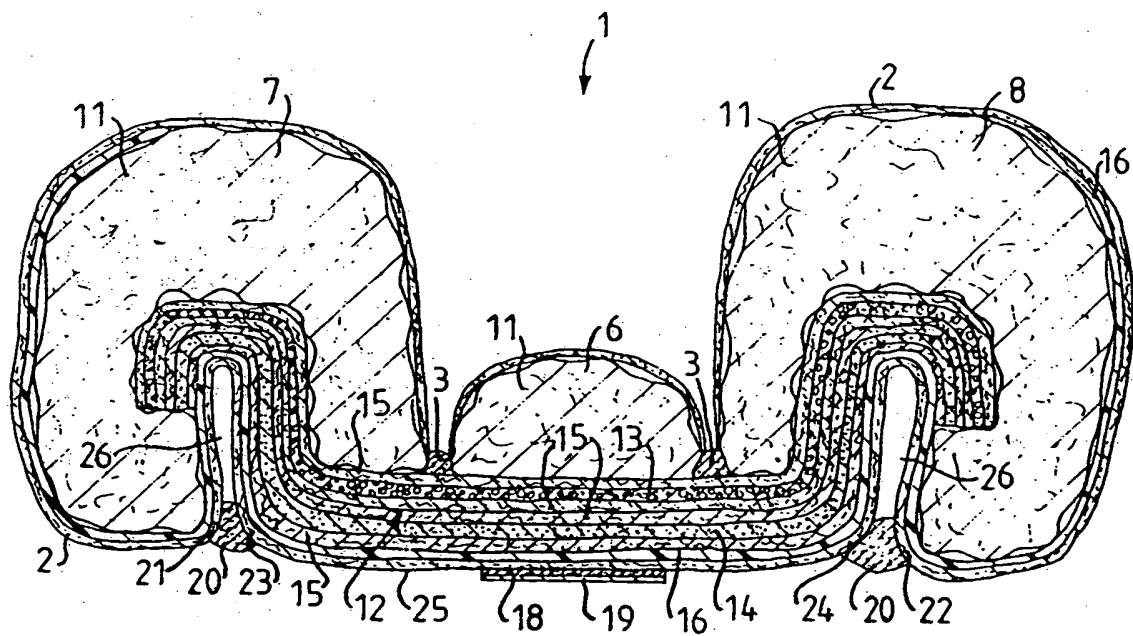


FIG. 2

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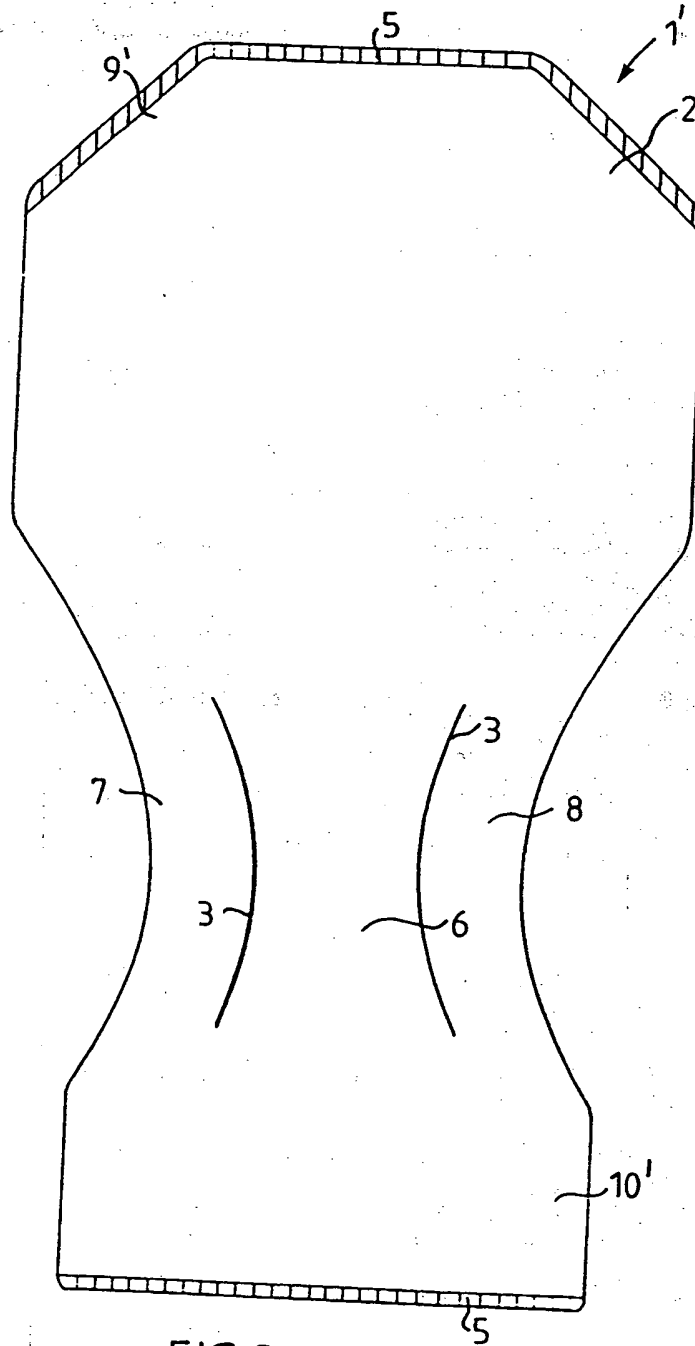


FIG. 3